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1987 SALARIES OF ACADEMIC CHEMISTS

ANALYSIS OF THE AMERICAN CHEMICAL SOCIETY'S 1987 SURVEY OF SALARIES AND EMPLOYMENT

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ACKNOWLEDGEMENTS

Each year, the American Chemical Society conducts salary surveys of its members. This report is one of four presenting detailed results of the 1987 Salary and Employment Status Survey. The four reports are: *1987 Salaries of Non-academic Chemists, 1987 Salaries of Academic Chemists, 1987 Salaries of Non-academic Chemical Engineers,* and *1987 Employment Status and Demographic Characteristics of ACS Members.* A summary of the survey findings was published in the June 29, 1987 issue of *Chemical and Engineering News.*

General oversight of the survey and its analysis was provided by the ACS joint Board-Council Committee on Economic Status, headed by Valerie D. Kuck[1], and by its subcommittee on surveys, chaired by Jack G. Kay[2]. The committee expresses its gratitude to the 12,000 ACS members who provided a valuable service to the profession by completing the survey questionnaire.

Joan Burrelli and Nguyen Bailey of ACS Statistical Services, managed by John Robert Jones, conducted this year's survey and prepared this report. Dr. Burrelli wrote the summary and comment on the following pages.

Robert K. Neuman, Head
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SUMMARY AND COMMENT

Joan S. Burrelli*

Salaries

Last year the Office of Statistical Services annualized salaries of academic chemists on 9 or 10 month contracts. Because the number of academic chemists on 11 or 12 month contracts has grown in the last several years, this year we are reporting separate salary figures for chemists on 9 or 10 month or on 11 or 12 month contracts. Approximately 60% of academic chemists are on 9 or 10 month contracts and 40% are on 11 or 12 month contracts.

In 1987 the median salary of a PhD full professor employed in a college or university was $43,000 for one on a 9 or 10 month contract and $58,200 for one on an 11 or 12 month contract. PhD associate professors' median salaries were $32,100 and $42,000 respectively, and PhD assistant professors' median salaries were $27,000 and $33,800 respectively for those on 9 or 10 month and 11 or 12 month contracts.

Median salaries for PhD full and associate professors increased only marginally from those of last year. The median salary of PhD full professors on 9 or 10 month contracts was 2.6% higher than that of last year; the median salary of PhD associate professors on 9 or 10 month contracts was 1.9% higher. Because the Consumer Price Index rose approximately 3% from March 1986 to March 1987, those salary increases represent decreases in constant dollars. PhD assistant professors' salaries, however, increased substantially over those of last year. The median salary of PhD assistant professors on 9 or 10 month contracts was 7.1% higher than that of last year. In constant dollars, this represents an increase of more than 4%.

Salaries in academia vary widely according to academic rank, school type, and work function (e.g., teaching, administration). Academic salaries are generally higher for full professors, those in public institutions, those in departments granting PhD degrees, and those in research as opposed to teaching.

Within ranks, median salaries do not vary widely according to length of experience. The median salary for a PhD associate professor with 10-14 experience since the BS and on a 9 or 10 month contract is $32,050; that for one with 25-29 years since the BS is $32,811.

Salaries of tenured faculty are somewhat higher than those of nontenured faculty. The median salary of a tenured PhD associate professor on a 9 or 10 month contract is $33,000; that of a nontenured PhD associate professor on a 9 or 10 month contract is $29,000.

Salaries for women academic chemists are generally lower than those for men. The median 9 or 10 month contract salary for women PhDs in academia was 84% of that for men. The difference in men's and women's median salaries is partly due to differences in rank. Women chemists in academia are less likely than men chemists to be full professors. The median salaries of men and women chemists with comparable rank are more nearly equal. For example, the median salary of women PhD full professors on 9 or 10 month contracts is 90% that of men's.

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*Dr. Burrelli is Senior Research Associate in the ACS Office of Statistical Services.

NOTE: Results of the 1987 ACS Salary and Employment Status Survey are presented in a new format this year. Four separate reports: *1987 Salaries of Non-academic Chemists, 1987 Salaries of Academic Chemists, 1987 Salaries of Non-academic Chemical Engineers,* and *1987 Employment Status and Demographic Characteristics of ACS Members* replace the traditional one report. Also, the format of the tables is new. If you have comments or suggestions to make concerning this format, please contact Joan Burrelli at the ACS Office of Statistical Services (202-872-4433).

A METHOD FOR ESTIMATING AVERAGE SALARIES

A compact summary of the information in this report is possible through a statistical technique known as multiple regression. This technique identifies which characteristics have the greatest effect on salaries, and results in a formula for estimating the average salary of respondents with certain characteristics.

For academic chemists responding to the 1987 survey, the three characteristics which account for most of the variation among salaries are rank, academic work function, length of contract (9 or 10 month or 11 or 12 month), the highest degree offered by the respondent's department, and the control (public or private) of the respondent's institution.

Table I displays the factors needed to estimate the average salary for any group of respondents who are PhD academic chemists employed full-time in college or universities with any combination of the listed characteristics.

For example, to estimate the average salary in March 1987 for academic chemists at the rank of full professor, engaged primarily in research, on an 11 or 12 month contract, and employed in a PhD-granting department in a public university, find the corresponding factors in Table I and multiply them together with the base salary for all academic chemists:

($24,827) x (1.604) x (1.176) x (1.148) x (1.085) x (1.000) = $58,332

Table I

SALARY FACTORS FOR ACADEMIC CHEMISTS

BASE SALARY	$24,827
RANK:	
Professor	1.604
Associate Professor	1.208
Assistant Professor	1.000
Instructor/Lecturer	0.981
Non-faculty Research Associate	0.869
Unranked Faculty Member	1.207
WORK FUNCTION:	
Teaching	1.000
Research	1.176
Administration	1.316
LENGTH OF CONTRACT	
9 or 10 Month	1.000
11 or 12 Month	1.148
HIGHEST DEGREE OFFERED IN DEPARTMENT:	
Bachelor's or Master's	1.000
Doctorate	1.085
INSTITUTIONAL CONTROL:	
Public	1.000
Private	0.931

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TECHNICAL NOTES

The target population of the 1987 Salary and Employment Status Survey was those ACS members who had U.S. mailing addresses, were not older than 70, and had neither student, retired, nor emeritus status. On January 31, 1987 the ACS membership totalled 129,808, of which approximately 90,000 were eligible for inclusion in the survey. A systematic sample of 20,000 members with non-chemical engineering degrees (mostly chemists) and all 6,965 members with chemical engineering degrees were selected from the target population.

The survey questionnaires were mailed to this sample of 26,965 members by bulk mail during the week of March 2-6. By the May 15 cut-off date, 11,982 (44.4%) usable questionnaires had been returned.

Members indicating a degree field of chemical engineering were oversampled this year in order to produce a separate report on chemical engineers' salaries. To make the data base from which the non-chemical engineers' tables were produced comparable to those of previous years, a random sample of 24% of those oversampled was drawn and included with the 24% sample of non-chemical engineers (the 20,000 out of approximately 83,000 non-chemical engineers eligible for inclusion in the survey).

Definitions

For the purposes of the survey analysis only, the following definitions were used:

Chemist: A respondent who indicated a work specialty of chemistry or biochemistry (categories 2 through 14 of Question I.B. on the questionnaire) or a non-chemistry work specialty (categories 15 and 16) and a degree field of chemistry or biochemistry.

Unemployed: A respondent who is unemployed and seeking employment (category 4 of Question I.D. on the questionnaire).

This report represents the respondents' principal annual salaries as of March 1, 1987. The respondent's age is given as of March 1, 1987. A respondent's state and geographic region refer to place of residence rather than place of employment. A respondent's metropolitan area refers to place of employment. A list of geographic regions and their member states is on page 8 of this report. A list of metropolitan areas and their component 3-digit ZIP codes appears on page 9.

Small Cell Count

If the number of responses in a cell of a salary table is small, then the sample salary statistics for that cell may not accurately estimate the corresponding population salary statistics. In general, a cell containing fewer than 15 responses does not provide a useful estimate of the median salary, and a cell containing fewer than 25 responses does not provide a useful estimate of the 25th or the 75th salary percentile. For this reason, cells containing fewer than 15 responses were suppressed in the tables in this book.

Median

If a sample of size n is arranged in ascending order of magnitude, the median Md is given by the ((n+1)/2)th value. If (n+1)/2 is not an integer, then the median is a weighted average of the two values whose ranks are closest to (n+1)/2.

Discrepancies Among Tables

Some pairs of tables contain totals that should be identical but are not. For example, two tables that present information about PhD respondents should show the same total number of PhDs. They might, however, show different totals. To illustrate, if one table groups the PhDs according to specialty and the other groups them according to geographic region, the totals will differ unless the number who did not indicate their specialty is the same as the number who did not indicate their geographic region.

Comparing Salaries

Often questions arise concerning B.S. chemists' salaries as compared with M.S. chemists', or women's salaries as compared with men's. These and similar comparisons require caution.

Statistical tests should be performed to determine whether observed differences in salaries of various sample groups could be mere chance occurrences resulting from peculiarities of the sample. Whether a difference in salaries is "statistically significant" depends not only on the magnitude of the difference but also on the sample size and the magnitude of the sample standard deviations.

Discussion of statistical tests of significance can be found in *Introductory Statistics for Business and Economics* by Thomas H. Wonnacott and Ronald J. Wonnacott, N.Y.: Wiley, 1984; and other similar texts.

GEOGRAPHIC REGIONS

PACIFIC

Alaska
California
Hawaii
Oregon
Washington

MOUNTAIN

Arizona
Colorado
Idaho
Montana
Nevada
New Mexico
Utah
Wyoming

WEST NORTH CENTRAL

Iowa
Kansas
Minnesota
Missouri
Nebraska
North Dakota
South Dakota

WEST SOUTH CENTRAL

Arkansas
Louisiana
Oklahoma
Texas

EAST NORTH CENTRAL

Illinois
Indiana
Michigan
Ohio
Wisconsin

EAST SOUTH CENTRAL

Alabama
Kentucky
Mississippi
Tennessee

MIDDLE ATLANTIC

New Jersey
New York
Pennsylvania

SOUTH ATLANTIC

Delaware
District of Columbia
Florida
Georgia
Maryland
North Carolina
South Carolina
Virginia
West Virginia

NEW ENGLAND

Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

METROPOLITAN AREAS

Metropolitan Area	Three-Digit ZIP Codes
Atlanta, GA	300-303
Baltimore, MD	210-214
Boston, MA	017-024
Chicago, IL	463,464,600-606
Cincinnati, OH	410, 450-452, 470
Cleveland-Akron, OH	440-443
Columbus, OH	430-432
Dallas, TX	750-753, 760-762
Dayton, OH	453-455
Denver, CO	800-804
Detroit, MI	480-483
Houston-Beaumont, TX	770-777
Los Angeles, CA	900-918,926-928
Miami, FL	330-333
Newark, NJ	070-076,079
New York, NY	100-108,110-114,116
Philadelphia, PA	189-191, 193, 194
Pittsburgh, PA	150-152
St. Louis, MO	620-622, 630-633
San Francisco, CA	940-951
Washington, DC	200-209, 220-223

See *1987 National Five-Digit ZIP Code and Post Office Directory*, United States Postal Service, for the three-digit ZIP codes corresponding to the above metropolitan areas.

Table 1.1.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and CONTRACT STATUS
1987 ACS Salary Survey

Rank & Contract Status	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Full Professor						
Total	699	49,491	15,514	38,700	46,000	58,000
9 or 10 Month	494	45,310	12,520	37,009	43,000	51,718
11 or 12 Month	205	59,565	17,333	49,000	58,167	70,000
Associate Professor						
Total	267	35,453	8,680	29,900	34,000	40,300
9 or 10 Month	190	32,761	5,950	28,902	32,125	36,000
11 or 12 Month	77	42,096	10,621	35,300	42,000	46,000
Assistant Professor						
Total	224	29,018	5,746	25,000	28,000	32,000
9 or 10 Month	170	27,469	4,022	25,000	27,000	30,000
11 or 12 Month	54	33,891	7,446	28,500	33,750	38,500
Instructor						
Total	65	29,924	10,082	23,000	27,900	32,410
9 or 10 Month	24	24,969	6,034	20,950	23,500	27,950
11 or 12 Month	41	32,825	10,879	25,000	31,000	37,375
Research Associate						
Total	68	31,946	9,691	23,800	30,500	39,800
11 or 12 Month	68	31,946	9,691	23,800	30,500	39,800
No Ranks						
Total	25	39,049	18,895	29,000	34,000	42,000
9 or 10 Month	21	36,746	17,038	29,000	32,350	40,000

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.2.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK, and YEARS SINCE BS - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Years Since BS	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Full Professor						
Total	449	45,053	12,344	37,000	42,879	50,000
15-19	26	42,413	10,086	36,000	41,100	48,000
20-24	94	41,329	10,756	33,639	38,575	47,000
25-29	97	44,555	11,674	37,000	42,300	50,000
30-34	101	44,750	9,881	38,600	43,000	50,000
35-39	77	45,902	13,848	37,500	42,900	52,000
40 Or More	50	53,617	15,794	42,370	49,774	68,000
Associate Professor						
Total	173	32,843	5,933	28,902	32,000	36,000
10-14	21	31,999	7,070	28,500	32,050	34,000
15-19	56	32,611	6,226	28,450	31,700	36,750
20-24	50	33,013	4,532	30,000	32,000	36,000
25-29	19	32,835	6,346	28,000	32,811	36,000
Assistant Professor						
Total	155	27,508	4,116	25,000	27,000	30,000
5-9	30	26,468	2,917	24,000	26,795	28,500
10-14	78	28,023	4,533	25,000	27,000	30,600
15-19	30	27,342	3,769	25,000	27,450	29,000
Instructor						
Total	21	24,965	6,162	21,000	24,000	27,900
No Ranks						
Total	20	36,859	17,472	27,150	32,175	41,000

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.2.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK, and YEARS SINCE BS - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Years Since BS	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Full Professor						
Total	180	58,594	16,708	47,650	57,763	70,000
20-24	32	52,355	15,226	40,709	50,080	61,000
25-29	53	59,588	15,225	50,000	57,300	70,000
30-34	34	57,216	16,779	44,604	57,863	70,000
35-39	38	64,480	17,631	50,000	63,950	80,000
40 Or More	16	58,671	19,256	48,908	61,364	69,500
Associate Professor						
Total	64	41,305	9,188	35,000	42,000	46,000
15-19	18	44,241	10,441	36,700	42,200	48,000
20-24	21	42,779	8,028	39,000	42,000	48,500
Assistant Professor						
Total	47	34,125	7,376	28,800	34,000	38,500
10-14	20	33,619	6,039	31,000	34,138	35,500
Instructor						
Total	35	32,600	10,147	25,000	30,400	37,375
Research Associate						
Total	57	31,151	9,868	23,500	29,700	39,160

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.3.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and ACADEMIC WORK FUNCTION - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Work Function	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Teaching						
Full Professor	236	39,361	7,772	34,449	39,200	44,551
Associate Professor	99	30,549	5,491	26,936	30,000	34,000
Assistant Professor	77	25,490	3,296	23,000	25,000	28,000
Instructor	19	25,698	6,314	21,000	24,600	29,100
No Ranks	17	30,783	7,242	25,300	32,000	34,500
Teaching,Research						
Full Professor	54	49,321	13,240	40,500	46,050	57,000
Associate Professor	24	35,087	5,514	31,025	35,000	38,500
Assistant Professor	29	28,452	3,940	26,000	27,500	30,500
Research						
Full Professor	59	56,255	13,739	45,200	54,500	65,000
Associate Professor	19	36,938	5,992	33,000	35,000	42,000
Assistant Professor	27	29,084	2,788	27,000	29,000	31,138

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.3.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and ACADEMIC WORK FUNCTION - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Work Function	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Teaching						
Full Professor	30	41,777	9,611	34,000	40,750	49,500
Research						
Full Professor	58	61,470	17,245	50,000	60,500	72,000
Associate Professor	32	44,364	8,734	41,728	45,047	47,500
Assistant Professor	26	35,374	5,017	33,000	34,500	38,500
Instructor	24	32,968	10,234	26,000	31,000	38,500
Research Associate	57	30,319	9,024	23,000	28,000	37,000
Administration						
Full Professor	31	60,803	15,814	46,800	60,000	74,300

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.4.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and SPECIALTY - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Specialty	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Biochemistry						
Full Professor	55	47,102	11,859	38,250	44,000	55,317
Associate Professor	27	32,815	5,627	30,000	32,200	37,060
Assistant Professor	18	26,292	2,993	24,750	26,250	28,000
General Chemistry						
Full Professor	46	36,195	8,722	29,500	35,950	41,850
Associate Professor	22	31,031	6,284	26,730	30,250	33,400
Inorganic Chemistry						
Full Professor	50	44,389	7,764	38,000	44,250	50,000
Associate Professor	20	33,850	4,485	29,250	34,750	36,550
Assistant Professor	25	27,807	2,884	25,565	28,000	30,000
Organic Chemistry						
Full Professor	136	44,873	12,994	36,500	42,625	51,000
Associate Professor	48	32,654	6,837	28,450	31,198	37,366
Assistant Professor	33	26,630	2,903	24,400	26,500	28,013
Physical Chemistry						
Full Professor	96	47,312	13,770	38,679	44,270	52,000
Associate Professor	32	33,163	4,656	30,150	33,115	35,550
Assistant Professor	34	27,075	3,936	24,750	26,900	30,900
Other Chemical Science						
Full Professor	111	47,418	12,632	38,600	45,000	55,000
Associate Professor	41	32,933	6,500	29,000	33,000	36,000
Assistant Professor	46	28,987	5,371	25,100	28,750	32,500

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.4.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and SPECIALTY - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Specialty	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Biochemistry						
Full Professor	78	61,511	17,424	50,000	61,864	72,000
Associate Professor	28	45,489	9,304	41,278	45,250	48,250
Assistant Professor	22	35,590	4,852	33,000	35,500	38,500
Instructor	18	33,607	11,091	25,000	31,000	35,000
Research Associate	22	29,964	8,908	23,000	27,500	37,000
Inorganic Chemistry						
Full Professor	18	64,802	19,012	51,500	59,150	77,000
Physical Chemistry						
Full Professor	21	55,735	19,082	40,100	53,000	68,000
Other Chemical Science						
Full Professor	61	59,664	16,933	50,000	57,000	70,000
Associate Professor	25	43,348	12,324	35,000	42,000	46,600
Assistant Professor	20	36,548	8,002	30,000	33,750	43,350
Research Associate	32	33,235	9,002	26,000	32,500	40,140

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.5.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and TENURE STATUS - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Tenure Status	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Tenured						
Full Professor	480	45,490	12,517	37,180	43,000	52,000
Associate Professor	165	33,234	5,803	29,400	33,000	36,100
Assistant Professor	23	28,253	2,985	25,200	28,000	31,000
No Ranks	17	40,183	17,157	32,000	34,500	42,000
Not Tenured						
Associate Professor	24	29,495	6,171	25,500	29,000	33,500
Assistant Professor	146	27,356	4,169	24,820	27,000	30,000
Instructor	23	24,086	4,298	20,900	23,000	27,900

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.5.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and TENURE STATUS - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Tenure Status	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Tenured						
Full Professor	189	60,234	17,373	49,000	58,600	71,000
Associate Professor	57	43,975	10,229	39,000	43,000	47,000
Not Tenured						
Full Professor	16	51,672	15,189	40,450	51,000	61,000
Associate Professor	18	36,381	9,285	30,000	35,850	42,000
Assistant Professor	52	33,612	7,324	28,300	33,500	38,500
Instructor	39	33,154	11,002	25,000	31,000	38,000
Research Associate	60	31,287	9,377	23,550	30,500	38,480

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.6.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and INSTITUTIONAL CONTROL - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Institutional Control	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Public						
Full Professor	310	47,124	11,825	39,000	44,801	52,000
Associate Professor	127	33,334	5,517	29,938	33,000	36,000
Assistant Professor	97	28,150	3,558	25,900	28,000	30,500
Instructor	19	25,014	6,674	20,900	23,000	29,100
Private						
Full Professor	170	41,853	13,224	33,000	39,000	49,700
Associate Professor	55	31,449	6,478	26,936	31,000	36,000
Assistant Professor	68	26,520	4,016	24,000	26,000	28,900

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.6.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and INSTITUTIONAL CONTROL - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Institutional Control	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Public						
Full Professor	147	60,023	15,386	50,000	58,300	70,000
Associate Professor	51	44,165	10,654	39,000	42,000	46,600
Assistant Professor	27	35,975	6,182	32,000	35,000	38,500
Instructor	21	36,092	10,602	28,000	31,800	42,000
Research Associate	44	32,716	10,100	24,000	31,500	39,940
Private						
Full Professor	52	58,219	22,573	41,750	53,250	73,268
Associate Professor	19	35,907	9,653	29,000	35,000	45,000
Assistant Professor	26	31,549	8,158	25,010	29,400	38,500
Instructor	16	29,805	10,901	23,000	26,000	33,800
Research Associate	19	32,384	8,596	24,000	33,500	40,000

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.7.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK, and TYPE OF INSTITUTION - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Type of Institution	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
BS Degree						
Full Professor	148	37,354	7,642	31,750	37,005	42,000
Associate Professor	61	29,639	4,529	26,936	29,400	32,000
Assistant Professor	57	25,031	3,535	23,000	25,000	27,500
MS Degree						
Full Professor	89	40,770	6,313	37,000	40,292	44,000
Associate Professor	37	31,890	5,054	29,938	32,000	35,000
Assistant Professor	27	26,969	3,625	25,000	26,500	29,000
Doctorate						
Full Professor	240	52,158	13,068	42,763	50,000	59,150
Associate Professor	80	35,424	5,669	32,000	35,000	39,723
Assistant Professor	82	29,343	3,574	26,900	28,700	31,300

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.7.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK, and TYPE OF INSTITUTION - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Type of Institution	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Medical or Professional School						
Full Professor	52	65,889	17,594	52,270	61,864	72,630
Associate Professor	30	47,218	12,109	41,100	45,400	49,644
Assistant Professor	19	37,150	6,804	31,700	36,982	42,700
Instructor	17	35,476	11,870	25,000	31,800	47,300
Research Associate	15	27,853	8,228	21,000	24,000	35,500
BS Degree						
Full Professor	25	39,757	9,437	31,800	37,600	48,200
Associate Professor	15	31,860	7,490	28,500	30,535	35,000
MS Degree						
Full Professor	16	51,506	11,137	43,625	55,000	58,013
Doctorate						
Full Professor	109	62,651	15,742	51,000	62,000	73,000
Associate Professor	30	42,266	6,097	40,000	42,000	46,000
Assistant Professor	24	35,494	5,745	33,000	35,000	38,250
Instructor	16	34,819	9,890	30,200	32,018	37,688
Research Associate	51	32,876	9,644	24,000	33,000	40,280

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.8.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and SEX - 9 or 10 Month Contract
1987 ACS Salary Survey

Rank & Sex	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Men						
Total	802	39,186	12,931	30,000	37,000	45,000
Full Professor	462	45,566	12,498	37,100	43,000	52,000
Associate Professor	159	33,133	5,717	29,000	32,811	36,500
Assistant Professor	150	27,524	4,121	25,000	27,000	30,000
No Ranks	19	37,178	17,733	29,000	32,350	42,000
Women						
Total	97	33,206	10,519	26,100	30,900	38,375
Full Professor	32	41,617	12,443	32,360	38,750	49,200
Associate Professor	31	30,850	6,812	26,600	31,000	35,000
Assistant Professor	20	27,064	3,241	24,500	27,200	30,200

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.8.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and SEX - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Sex	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Men						
Total	387	48,397	18,605	35,000	46,000	59,950
Full Professor	194	59,859	17,447	49,000	58,647	71,000
Associate Professor	70	42,676	10,278	36,400	42,000	46,100
Assistant Professor	41	34,506	7,619	28,500	34,000	39,000
Instructor	27	33,841	12,126	25,000	31,300	40,000
Research Associate	53	32,210	9,371	24,000	31,000	39,600
Women						
Total	62	36,703	14,120	26,200	35,000	44,000
Research Associate	15	31,012	11,048	21,000	28,000	42,000

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.9.1

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and GEOGRAPHIC REGION - 9 or 10 Month Contract -
1987 ACS Salary Survey

Rank & Geographic Region	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Pacific						
Full Professor	61	54,185	14,640	45,000	50,000	68,000
Associate Professor	15	33,806	6,351	31,000	35,000	38,400
Mountain						
Full Professor	30	41,632	9,111	35,560	39,200	47,000
West North Central						
Full Professor	44	39,741	9,930	33,696	37,320	43,500
Assistant Professor	22	25,805	2,324	23,800	25,450	27,000
West South Central						
Full Professor	34	39,223	9,737	31,360	37,833	45,000
Associate Professor	17	33,354	5,156	30,000	31,500	37,060
East North Central						
Full Professor	99	45,591	12,952	37,000	42,000	52,000
Associate Professor	33	32,736	6,348	29,000	32,000	34,400
Assistant Professor	31	27,610	3,973	24,050	28,000	30,700
East South Central						
Full Professor	29	42,212	12,594	37,000	40,700	45,000
Associate Professor	16	29,399	5,104	27,668	29,450	32,800
Assistant Professor	15	25,425	3,750	24,400	25,000	27,400
Middle Atlantic						
Full Professor	94	47,253	12,289	40,000	45,000	55,000
Associate Professor	27	33,325	7,337	27,000	34,000	38,000
Assistant Professor	28	27,471	3,924	26,000	27,250	29,500
South Atlantic						
Full Professor	66	43,857	11,119	37,000	41,500	49,000
Associate Professor	44	33,554	5,801	30,000	33,777	36,741
Assistant Professor	34	27,634	5,371	23,275	27,250	30,600
New England						
Full Professor	31	44,454	8,739	39,200	45,000	47,500
Associate Professor	16	33,603	5,393	29,250	32,725	37,250

Note: Cells with fewer than 15 cases have been suppressed.

Table 1.9.2

SALARIES of PhD ACADEMIC CHEMISTS employed FULL-TIME
according to RANK and GEOGRAPHIC REGION - 11 or 12 Month Contract
1987 ACS Salary Survey

Rank & Geographic Region	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Pacific						
Full Professor	19	69,732	19,704	55,000	64,900	84,000
West North Central						
Full Professor	24	55,271	15,042	42,600	53,000	67,500
West South Central						
Full Professor	29	56,126	18,382	44,604	52,000	60,000
East North Central						
Full Professor	38	62,213	17,495	53,000	61,000	74,300
East South Central						
Full Professor	20	54,440	18,505	43,817	52,000	62,864
Middle Atlantic						
Full Professor	32	60,115	12,817	50,975	59,584	71,000
South Atlantic						
Full Professor	29	60,461	13,677	50,000	60,000	71,000
Associate Professor	16	42,609	7,563	38,300	42,750	46,000

Note: Cells with fewer than 15 cases have been suppressed.

STIPENDS of POST-DOCTORAL FELLOWS
according to INSTITUTIONAL CONTROL and WORK SPECIALTY
1987 ACS Salary Survey

Institutional Control & Work Specialty	Count	Mean	Standard Deviation	25th %-ile	50th %-ile	75th %-ile
Biochemistry						
Total	30	19,980	6,126	17,000	20,000	23,000
Public	21	21,106	5,480	17,000	20,645	23,500
Chemistry						
Total	74	19,207	3,876	16,700	18,000	21,000
Public	49	19,077	3,591	16,200	18,000	21,000
Private	25	19,460	4,451	17,000	18,000	20,000

Note: Cells with fewer than 15 cases have been suppressed.

American Chemical Society

OFFICE OF THE
EXECUTIVE DIRECTOR

1155 SIXTEENTH STREET, N.W.
WASHINGTON, D.C. 20036
Phone (202) 872-4600

February 24, 1987

Dear Colleague:

Each year the American Chemical Society studies the economic status of the U.S. chemical profession by surveying a sample of ACS members. You are one of about 25,000 members I am asking to participate in this survey, conducted under the aegis of the Joint Board-Council Committee on Economic Status. This year, the ACS will conduct a special study of the economic status of member chemical engineers. This year's sample, therefore, includes more than the usual number of chemical engineers.

Because a high response rate is needed to assure accurate results, your participation is an important service to our colleagues. Please take a few minutes now to complete the questionnaire and return it in the enclosed business reply envelope. The procedure is confidential, and the information you provide will be reported only as a part of aggregated data.

Findings will be reported to ACS members in several ways. Preliminary results will be presented at the spring meeting in Denver; early in the summer, the ACS will publish detailed analyses as Salaries 1987. At about the same time, Chemical and Engineering News will publish a cover story on the salaries and employment status of chemists and chemical engineers.

Please feel free to use the back of the questionnaire for whatever comments or suggestions you might care to make.

Thank you for your assistance.

Sincerely,

John K Crum

John K Crum

Encl.

1987 Comprehensive Salary and Employment Status Survey

I. EDUCATION AND EMPLOYMENT STATUS

A. PLEASE INDICATE THE YEAR IN WHICH YOU EARNED ANY OF THE FOLLOWING DEGREES:

Bachelor's	19 __ __	1-2
Master's	19 __ __	3-4
Doctorate	19 __ __	5-6

B. PLEASE CHECK THE APPROPRIATE BOX IN EACH COLUMN.

	Field of highest degree	ONE specialty most related to your current or most recent job
Chemical engineering	☐ 01	☐ 01
Biochemistry	☐ 02	☐ 02
General chemistry	☐ 03	☐ 03
Agricultural/food chemistry	☐ 04	☐ 04
Analytical chemistry	☐ 05	☐ 05
Clinical chemistry	☐ 06	☐ 06
Environmental chemistry	☐ 07	☐ 07
Inorganic chemistry	☐ 08	☐ 08
Materials science	☐ 09	☐ 09
Medicinal/pharmaceutical chemistry	☐ 10	☐ 10
Organic chemistry	☐ 11	☐ 11
Physical chemistry	☐ 12	☐ 12
Polymer chemistry	☐ 13	☐ 13
Other chemical science	☐ 14	☐ 14
Business Administration	☐ 15	☐ 15
Other Non-chemistry	☐ 16	☐ 16

7-10

C. Were you unemployed at any time during the calendar year 1986?

No ☐ 1 Yes ☐ 2 11

If yes, how many total weeks were you not employed and actively seeking employment during calendar year 1986?

__ __ weeks (ENTER A NUMBER FROM 1 TO 52) 12-13

D. PLEASE ENTER YOUR PRIMARY EMPLOYMENT STATUS AS OF MARCH 1, 1987. CHOOSE THE ONE CATEGORY THAT BEST FITS YOUR SITUATION.

Employed full-time (35 hours or more per week)	☐ 1
Employed part-time	2
Postdoctoral or other fellowship	3
Not employed but actively seeking employment	4
Not employed and NOT seeking employment	5

14

G. If you were UNEMPLOYED on March 1, how long had you been unemployed?

Less than 1 month	☐ 1
1 to 3 months	2
4 to 6 months	3
7 to 12 months	4
More than 1 year	5

15

H. If you were EMPLOYED on March 1, what are the first three digits of the zip code where you work?

__ __ __ 16-18

II. QUESTIONS ABOUT YOURSELF

A. Your sex:

Male ☐ 1 Female ☐ 2 19

B. Your marital status:

Single ☐ 1 Married ☐ 2 20

C. Age at last birthday before March 1, 1987:

__ __ years old 21-22

D. Citizenship or visa status:

U.S. native	☐ 1
U.S. naturalized	2
U.S. permanent resident visa	3
Other visa	4

23

E. Race or ethnic group:

American Indian or Alaskan Native	☐ 1
Asian or Pacific Islander	2
Black (not of Hispanic origin)	3
Hispanic	4
White	5
Other race or ethnic group	6

24

F. Please enter the two-letter post office abbreviation for the STATE in which you live.

__ __ 25-26

IF YOU ARE NOT CURRENTLY EMPLOYED, PLEASE SKIP TO SECTION IV, MOST RECENT OR CURRENT JOB.

III. CURRENT INCOME

A. If you are CURRENTLY EMPLOYED, how long have you worked for your current employer?

__ __ years __ __ months 27-30

B. BASE ANNUAL SALARY from PRINCIPAL JOB as of March 1, 1987. (DO NOT INCLUDE payments for bonus, second job, overtime work, summer teaching, or other supplemental earnings or employment.) If zero, please indicate. If on a 9 or 10 month contract, report the 9 or 10 month salary rather than an annualized salary.

$ _____ per year 31-36

C. TOTAL PROFESSIONAL INCOME during calendar year 1986. (INCLUDE consulting fees, base annual salary, income from second job, bonuses, payments for overtime, summer teaching, and other supplemental earnings.)

$ _____ per year 37-42

D. If you are currently employed, does your employer pay your ACS dues?

Yes ☐ 1 No ☐ 2 43

IV. DESCRIBE YOUR CURRENT OR MOST RECENT JOB.

IF YOUR CURRENT OR MOST RECENT EMPLOYER IS NOT AN ACADEMIC INSTITUTION, GO TO SECTION V AT THE TOP OF THE NEXT COLUMN.

CURRENT OR MOST RECENT EMPLOYMENT IS IN AN ACADEMIC INSTITUTION.

A. Current (or most recent) principal employer.

1. Public institution ☐ 1 Private institution ☐ 2 44

2. High school ☐ 1
   Medical or professional school ☐ 2
   College or university where the highest degree offered in chemical science is:
   - Associate ☐ 3
   - Bachelor's ☐ 4
   - Master's ☐ 5
   - Doctorate ☐ 6 45

B. Your academic rank:

- Full professor ☐ 1
- Associate professor ☐ 2
- Assistant professor, tenure track ☐ 3
- Instructor, lecturer, or non-tenure track ☐ 4
- Non-teaching research associate ☐ 5
- My institution does not have ranks ☐ 6 46

C. Have you been granted tenure?

Yes ☐ 1 No ☐ 2 47

D. Your basic contract is for a period of:

- 9 or 10 months ☐ 1
- 11 or 12 months ☐ 2 48

E. About what fraction of your total academic year assignment is devoted to:

	1/4 or less	1/3	1/2	2/3	3/4	full-time	
Teaching	☐	☐	☐	☐	☐	☐	49
Research	☐	☐	☐	☐	☐	☐	50
Administration	☐	☐	☐	☐	☐	☐	51
Other	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	52

F. What was your principal professional activity during the SUMMER OF 1986?

- Teaching ☐ 1
- Funded research or study ☐ 2
- Unpaid scholarly/academic ☐ 3
- Administration ☐ 4
- Consulting ☐ 5
- Non-academic employment ☐ 6
- Other ☐ 7 53

THANK YOU. YOU HAVE COMPLETED THE QUESTIONNAIRE. PLEASE USE THE BLANK SPACE ON THE BACK OF THIS QUESTIONNAIRE FOR COMMENTS.

V. CURRENT OR MOST RECENT EMPLOYMENT IS NOT IN AN ACADEMIC INSTITUTION.

A. Current (or most recent) principal employer.

- Self-employed ☐ 01
- Private industry
  - Non-manufacturing ☐ 02
  - Manufacturing
    - Basic chemicals ☐ 03
    - Specialty chemicals ☐ 04
    - Agricultural chemicals ☐ 05
    - Biochemical products ☐ 06
    - Coatings and paints ☐ 07
    - Electronics ☐ 08
    - Food ☐ 09
    - Glass, ceramics ☐ 10
    - Paper ☐ 11
    - Petroleum/natural gas ☐ 12
    - Pharmaceuticals, personal care ☐ 13
    - Plastics ☐ 14
    - Rubber ☐ 15
    - Soaps, detergents, surfactants ☐ 16
    - Steel or ferrous metals ☐ 17
    - Other metals, minerals ☐ 18
    - Other manufactures (specify) _____ ☐ 19
- Government
  - Federal (civilian) ☐ 20
  - State or local ☐ 21
  - Military ☐ 22
- Other non-academic
  - Hospitals, independent laboratory ☐ 23
  - Non-profit organization, other research institution ☐ 24
  - Other employment ☐ 25 54–55

B. Check the ONE work function that best describes your job.

- Research and Development
  - Management or administration of R&D ☐ 01
  - Basic research ☐ 02
  - Applied research, development, design ☐ 03
- General management, administration (other than research and development) ☐ 04
- Marketing, sales, purchasing, technical service, economic evaluation ☐ 05
- Production, quality control ☐ 06
- Forensic analysis, other laboratory analysis ☐ 07
- Writing, editing, abstracting ☐ 08
- Chemistry information services ☐ 09
- Computer programming, analysis, design ☐ 10
- Consulting ☐ 11
- Other ☐ 12 56

C. Were you eligible for a bonus during calendar 1986?

Yes ☐ 1 No ☐ 2

D. Did you receive a bonus during calendar 1986?

Yes ☐ 1 No ☐ 2

IF yes, please indicate amount

$_____ 59–64

VI. LEVEL OF RESPONSIBILITY:

Please examine the statements within each of the four groups (Duties, Technical Decisions and Recommendations, Supervision Received, and Supervision Exercised) and, within each group, check the box of the statement that most closely corresponds to your responsibility on the job.

A. Duties:

I receive on-the-job training working on simple projects or assisting more senior staff ☐ 1

I perform responsible and varied assignments within projects ☐ 2

I plan, conduct, and coordinate projects of some complexity ☐ 3

I undertake long-term and short-term planning and supervision of projects. I make decisions on work programs and have budgetary control of projects ☐ 4

I have full managerial responsibility for a function with full responsibility for the operation of a budget and long term planning ☐ 5 65

B. Technical Decisions and Recommendations:

I am responsible for minor technical details only, all other matters being checked ☐ 1

I am responsible for technical detail which is reviewed overall ☐ 2

I am responsible for technical matters but am subject to occasional review ☐ 3

I have full technical responsibility for projects ☐ 4

I am responsible for all technical matters including the delegation of responsibility ☐ 5 66

C. Supervision Received:

My work is assigned with detailed instructions, guidance being always available. My results are subject to close scrutiny ☐ 1

My work is assigned in terms of detailed objectives and priorities, guidance being available on problems and unusual features. My work is subject to scrutiny. ☐ 2

My work is assigned in terms of general objectives and priorities, guidance being available on policy or unusually complex problems. My work is reviewed for effectiveness only ☐ 3

My work is such that I receive executive instruction on broad overall objectives and it is reviewed only for its general effectiveness and adherence to policy ☐ 4

My work is unsupervised, other than I comply with the policy decided within the governing body ☐ 5 67

D. Supervision Exercised:

I have no authority but may give technical guidance to juniors working on the same project ☐ 1

I have no managerial responsibilities for qualified staff but may be assigned graduates, technicians, or other juniors as assistants from time to time ☐ 2

I supervise a group of qualified staff, technicians, and other employees. I assign and review their work. I can recommend on the selection, discipline, rating, training, and perhaps rate of pay ☐ 3

I am responsible for leaders of groups containing qualified staff, technicians, and other employees. I give guidance on policy and complex technical matters delegating responsibility for discipline, rating, training, and rates of pay ☐ 4

I have full control over senior staff who are in turn responsible for groups of qualified staff and other employees ☐ 5 68

THANK YOUR FOR YOUR PARTICIPATION.

PLEASE RETURN THIS QUESTIONNAIRE TO
ACS STATISTICAL SERVICES,
Room 202, 1155 16th Street NW, Washington, DC 20036

ACS OFFICE OF STATISTICAL SERVICES PUBLICATIONS

Salaries: The Office of Statistical Services annually surveys the ACS membership, gathering detailed information on member chemists and chemical engineers. The reports based on this survey contain statistical tables describing the respondents' employment status, employer, work function and specialty, salaries, and demographic characteristics.

Reports are available for each year from 1973 through the current year. In 1987, four separate reports are available: *1987 Salaries of Non- Academic Chemists, 1987 Salaries of Non-Academic Chemical Engineers, 1987 Salaries of Academic Chemists,* and *1987 Employment Status and Demographic Characteristics of ACS Members.*

Starting Salaries: The Office of Statistical Services also surveys new graduates in chemistry and chemical engineering each summer, and publishes reports detailing the graduates' employment status, post-graduation plans, starting salaries, and other employment and demographic characteristics.

Reports are available for each year from 1975 through the current year.

Professionals in Chemistry: The *Professionals in Chemistry* series compiles information concerning chemists and chemical engineers from ACS, government, and private industry sources. It details information on demography, employment, salaries, education, and supply and demand for the entire chemical profession.

Reports are available for each year from 1975 through 1978, and combined reports for 1979-1980, 1981-82, 1983-84, and 1985-86.

Special Reports:

1975 Report of Chemists' Salaries and Employment Status Supplement: Economic Status of Women in the ACS.

Women Chemists 1980: A supplemental report on the ACS's 1980 Survey of Salaries and Employment.

Women Chemists 1985: A supplemental report on the ACS's 1985 Survey of Salaries and Employment.

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